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NOTES ON RARE WESTERN SPHECID WASPS

BY CHARLES H. HICKS

University of Colorado

The Sphecid, *Sphex craspedotus*, is seemingly a rare species of digger wasp, some of the habits of which the present writer studied in 1929. Professor Fernald* characterizes the structure of the insect, in part, as follows: "This interesting species is the only one from North America in which there are no teeth or even traces thereof on the lower margin of the clypeus . . . Another unusual feature is that, while the segments farther forward may be quite dark, the last abdominal segment of the eight specimens seen was entirely ferruginous." He states that the insect has been reported only from California, especially at or near Los Angeles, and gives June 26, August 3 and August 28 as dates of capture. Based on the study of the eight females, he found the species to be somewhat below the average in size in the genus and these individuals to vary from 15 to 19 mm. in length.

My study of the nesting habits of this species involved three nesting females and their nests. These nests were obtained and studied after the nesting wasps had been observed on June 25-27, and on July 3. Each nest was located near the First National Studios along the Los Angeles River near Burbank, California. They were dug in the somewhat loose sand of the river bed or bank. The wasp observed and taken on June 26 is one of the paratypes of the species, the nest of which forms a basis for the following description.

The wasp was found provisioning her nest late in the morning of June 25 and also on the 26th. She came flying with a lepidopterous larva in her jaws at 11:29 a. m. on the second day. Alighting on the sand close to her nest, she released the prey near to the concealed and temporarily closed tunnel entrance. She removed a sand plug, backed in, grasped the larva

*Fernald, H. T. "The North American and West Indian Digger Wasps of the Genus *Sphex* (*Ammophila* auct.)". E. A. Painter Co. Deland, Florida, pp. 1-167. Pls. 1 and 11. Figs 1-39, 1934,

with her jaws and pulled it slowly from sight and into her cell. She was out almost immediately, but reëntered at once to remove some fine sand which had fallen within. A second errand of like import followed. She was then captured in order to have her for identification. The tunnel and nest was dug out and the cell content secured.

The tunnel extended almost vertically for a distance of 8.6 cm. The cell, to one side and almost at right angles to the shaft, contained seven long, slender green "measuring worms." The one farthest within the cell (probably first to be stored) had the wasp's egg attached to its dorsal side. The egg, long and slender, rested parallel with the length of the larva in the mid region and was about to hatch. It did so, at home, at 5 o'clock in the afternoon. On June 29th, at the same hour of the afternoon, the wasp larva had completely devoured two of the prey and had started on a third. It was in good condition but my notes end here, doubtless due to the press of circumstances.

The second nest was found at the same general nesting site as that of the first. It was excavated on June 27 and at a time when the upper tunnel had been temporarily closed between the storage of prey. The closure had been accomplished by means of a large piece of hard sand, caught some 20 mm. below the surface and above which loose sand had been scraped. This sand did not completely fill the empty space above the larger barrier before the outer cap, nearly flush with the surface, was fitted in place.

The wasp was observed at about 12:15 as she was dragging a green moth larva into the tunnel and to her cell. The prey, apparently, belonged to the Geometridæ as likewise did the others. The entrance to the shaft was not left open between capture and storage of prey and this female was taken as she was smoothing down the sand over the nest after she had it open for a short time. My notes do not designate her as a "tool user."

A study and measurement of this nest did not find the entrance completely circular; it had, roughly, a diameter of some 4.5 mm. by 6.5 mm. The fact that the tunnel had been formed in more or less loose, coarse sand, may have been the cause of the irregularity of the entrance outline. The length of the tun-

nel, in this instance, was about 8.2 cm. The maximum of the cell, at the end, was about 12 mm. The cell contained only two larvæ—the stored prey—to the side of one of which a wasp egg had been attached. This nest had been but partially provisioned as was evidenced from the insufficient food supply and from other facts.

Still a third nesting female was found as she began work on a nest at about 12 o'clock on June 27. The nest was marked and dug up July 3rd, at which time also the provisioner was taken. The nest had been dug, as the others, in sandy soil and extended 8.5 cm. in length. The diameter of the tunnel was 5 mm. near the surface. The cell, at the end of the tunnel, contained the host larva and two living prey. The wasp larva, in a somewhat curled position, measured 7 mm. in length. The remains of one eaten larva, consisting of the hard chitinous parts, was in the cell with the living larvæ. It seemed probable that the nest had not been entirely provisioned at this time.

This was found to be a fact because at my home the young wasp larva finished eating the provisions and devoured some which I substituted for the moth larvæ. This additional food consisted of two large mature *Anthophora* larvæ, alive and unstung, which had been taken from the cell of the bee. The waspling ate all of one and much of the other. Upon finishing its feeding, it began its cocoon, July 4, and by the end of the next day apparently had it complete. It emerged an adult on August 3.

The male of the species, according to Professor Fernald, is not known. At least, it has not been recognized. This suggests the value of rearing wasps, since it might fairly easily be obtained from the nest of a known female.

Another rare wasp is *Sphex aculeatus* of Fernald, 1934. This species was described from a mated pair taken by myself at Owens Lake, near Boulder, Colorado, and from some others. Fernald says: "I have seen specimens of this species from Colorado and Utah, but nearly all were taken in Oregon and California."

A female of the species was observed nesting in the sand at White Rocks, some 11 miles northeast of Boulder, on June 14, 1932. She was at the foot of the high cliffs and beneath a hack-

berry tree. The observations were made at 12 o'clock at a time when the wasp was filling in the entrance tunnel to her nest. She did so by using an old hackberry seed to close the upper end of the shaft. Sand was scraped in over this, and some score or more of objects were brought to further cover and conceal the nest site. There was no tool using noted at this time.

Later, the same summer, on and about July 25 wasps of this species were found in Gregory Canyon in the mountains west of Boulder. These were digging nests on the side of a slope near a foot and bridle path. One female removed seven loads of soil between 10:48 and 10:49 a. m. and again seven loads in the minute between 10:52 and 10:53. She worked before, between, and after these stated periods but was caught for identification before her nest was completed. The soil was removed with her mandibles and carried away and downhill between them (possibly assisted by her fore legs) as she flew to the place of deposit. This spot was about four feet distant and the impact of the released load could be heard as it struck the ground. The release was made a few inches above the surface, and immediately the wasp flew back for more. One load was so large and heavy that the wasp was not able to fly with it after a typical and normal fashion and only reached the refuse spot by short flights and hops.

Another wasp was found as she started a tunnel. She bit the soil loose and removed it in the manner stated above. A loud buzzing was produced when she tried to remove a large pebble which was in the path of her progress. The number of loads carried out at various periods of one minute each were six, five, five, and six. These were carried downhill also, and each time she was seen to go and to return over much the same path. At one time she stopped her work, flew to a sumac bush growing nearby, walked over the leaves dragging her feet as though trying to remove adhering dust and soil. Then she moved to a stem where the cleaning continued, although by means of brushing one leg against another and later both against her body.

At 11:12 and after a short period of work she had dug her tunnel to a depth greater than that of the length of her body. After this time and before I caught her, she increased the speed

of her activity. This was thought to have been caused by the rapid increase of air and ground temperature. It was noted that this wasp was not readily frightened at my proximity and that it was not disconcerted by my attentions.

S. aculeatus was found at Owens Lake on September 27. This specimen was a female which appeared old and worn. Still earlier in the same month (September 13) at Fort Collins, Colorado, a female was found "sleeping" on a stem in late afternoon. She had grasped the branch with her mandibles, her body nearly at right angles to it, although only the hind pair of legs had released their clasp and aid in support.

It would appear from the dates of capture that in Boulder County, Colorado, we have at least two generations of this wasp a year. This and other facts await further study and it is hoped that the work of another season may do much to clear up many points in question.

The tool using habits of the digger wasps has always been of interest to students of insects since it was first reported by Professor Williston in 1892. It has since been observed a number of times. Among those who have seen and reported this behavior are: S. W. Williston (1892); G. W. and E. G. Peckham (1898); Cart Hartman (1904); H. B. Hungerford and F. X. Williams (1912); Phil and Nellie Rau (1918); G. C. and E. G. Wheeler (1924); and C. H. Hicks in two separate reports and species (1932). T. Pergande (1895) also, has been credited with a report on the tool using habit. I have read the paper by Pergande many times and have been unable to find grounds for this assumption.

Professor Hartman observed the use of a pebble as a tool by the wasp, *S. procerus* in 1904. Wheeler and Wheeler in 1924 observed it in this same species reported by the name of *S. gryphus*. It is with pleasure that I support these records by observations of my own made on this same species at Boulder on August 4, 1933. *S. aberti* and *S. procerus* are the two American digger wasps whose habits are probably best known. *S. aberti* is the species studied by Williston in 1892 (by name of *Ammophila yarrowi*) and whose tool using habits has attracted much attention. A much needed study at this time is a critical

and detailed investigation and comparison of nest-closure and tool-using among our digger wasps.

The writer is pleased to express his thanks to Professor H. T. Fernald who has determined the specimens reported in this account and who has generously aided with reference material, and to Professor Norma LeVeque for critically reading the manuscript and for helpful suggestions.

A NEW COENONYCHA FROM NEVADA

(Coleoptera; Scarabaeidæ)

BY LAWRENCE W. SAYLOR

University of California, Berkeley

Cœnonycha stohleri Saylor, new species

Oblong-oval, piceous, shining, with faint greenish lustre. Front and clypeus very coarsely densely variolately punctured; vertex impunctate; apex reflexed and subtruncate, angles obtuse but very distinct. Antennæ 8-segmented, the club much smaller than the funicle, the fourth segment as long as the second and third combined. Thorax with disc sparsely moderately coarsely punctured, a little more closely punctured at sides, some of the punctures with short recumbent hairs; each side near lateral angulation with a small fovea; sides subangulate at middle, front angles acute and produced, hind angles completely obliterated and the hind part broadly arcuate. Elytra two and one-half times longer than thorax, surface coarsely rugose, with sparse suberect white hair; apex of each elytron broadly rounded, both towards the suture and the outer margin. Pygidium polished, with sparse erect white hair. Abdomen sparsely punctured, with short suberect hair. Tarsal claws cleft, the inferior tooth shorter. First segment of front tarsi strongly elongate; hind tarsi much longer than the tibiae, first segment shorter than the next two combined. Hind tibial spurs spinose, one-half the length of the others. Length 5.5 mm.

The unique type, from White Rock Springs, Nye County, Nevada, May, 1931, and presented to me by Dr. R. Stohler, is in the collection of the California Academy of Sciences (No. 4010). This species can be confused with no other described species of the genus, since all others are some shade of brown or testaceous.

R NOTES ON AMERICAN TRYPETIDÆ (DIPTERA)

III. THE GENUS TEPHRELLA T.O.

BY MARSTON BATES EKE

Zoological Laboratories, Harvard University

The present paper deals with the American Trypetidæ placed in the genus *Aciurina* by Curran (1932, p. 9). The other groups with an *Aciura*-like wing pattern were reviewed briefly in a previous paper (Bates, 1933). I am indebted to Prof. J. M. Aldrich for most of the material reported on here; the National Museum collection contains some very fine bred series of several species, and all of the forms are represented except the doubtful *johnsoni* and an allied new form. Dr. F. R. Cole kindly sent me two paratypes of his *maculata* and some other material for study; Mr. E. T. Cresson, Jr., lent me some of the Philadelphia Academy material. Thanks to the courtesy of Mr. C. H. Curran, I have been able to examine the types of his species in the American Museum of Natural History.

None of the old world species of *Tephrella* has been seen, so the present generic placing of the American forms cannot be regarded as certain. The relationship, however, seems quite clear, in view of Hendel's excellent diagnosis of the genus (1927, p. 112); even the wing pattern of some of the Old World species is remarkably similar to that of some of our American forms. The distribution of the group in the Himalayas, Siberia, Mongolia, and the western United States, seems quite natural. The genus is closely related in habit and structure to *Eurosta*, from which it may be distinguished by the somewhat narrowed front.

Apparently all of the species make galls on compositæ, especially *Bigelowia*, and probably more extensive breeding will bring to light additional forms. The botany of the host plants is somewhat involved, and in no case has it been possible to check the determinations. *Chrysothamnus* and *Bigelowia* are accepted by many botanists as two genera, united by others; the spelling *Bigelovia* seems to have no standing in botanical literature.

Genus TEPHRELLA Bezzi

Tephrella Bezzi, 1913, p. 151 (genotype, *T. decipiens* Bezzi);

Hendel, 1914, p. 86; Hendel, 1927, p. 112.

Aciurina Curran, 1932, p. 9 (genotype, *A. trixa* Curran).

Front about as high as broad at the vertex: slightly higher than broad in *lutea*, *thoracica* and the southern *ferruginea*; slightly broader than high in *bigeloviae* and *maculata*. Typically there are three pairs of lower orbital bristles, two of upper; these vary greatly in development; all are dark and strong in *lutea*, while all are colorless in *trixa*. Third antennal joint rounded, twice as long as the second, or less, the arista shortly pubescent. Face shallowly excavated, the oral margin projecting slightly, the occipitals white and stumpy. Head about as broad as the thorax or slightly broader. Dorsum of thorax covered with a short, thick, colorless or yellowish pile, except in *lutea*, the dorso-central bristles behind the suture but well in front of the anterior supra-alars. Scutellum with only one pair of bristles. Abdomen usually shining black, red, or brown; sixth abdominal segment of female shorter than fifth. First longitudinal vein ending before the middle of the costal margin; second vein may be waved or straight; third vein bearing a few scattered bristles above and below, being most completely bristled in *thoracica*; last section of the third vein generally distinctly bowed upward; small cross-vein over the discal half of the discal cell. Anal cross-vein nearly or quite straight.

Twelve American species are assigned to *Tephrella* here; Hendel (1927) lists four Palearctic species; the genotype (*decipiens*) was described from high altitudes in the Himalayas. The African species assigned to this genus by Bezzi do not really belong here, according to Hendel. Three American species, *opaca*, *johnsoni* and *euarestoides*, differ from the above generic diagnosis in several important respects, but at the present time their generic separation seems premature.

KEY TO THE AMERICAN SPECIES

1. Wings hyaline with brown markings.....2
- Wings brown, with hyaline indentations and spots.....3
2. Stigmal cell about twice as long as high at base (11) *semilucida*
- Stigmal cell about as long as high at base.....(12) *notata*
3. First posterior cell with hyaline markings.....7
- First posterior cell entirely brown.....4
4. Alula hyaline 5
- Alula brown 6
5. Second posterior cell with a single large hyaline indentation
.....(4) *lutea*
- Second posterior cell with two narrow indentations (8)
..... *ferruginea*
6. Third posterior cell with several round hyaline spots (5)
..... *aploppapi*

- This cell with two hyaline indentations..... (6) *thoracica*
- 7. Apical margin of the wing with several hyaline indentations as in *Euaresta*..... (3) *euarestoides*
- Margin of the submarginal and first posterior cells entirely brown 8
- 8. A hyaline indentation which begins in the marginal cell extends across veins 2, 3 and 4 to the discal cell..... 9
- This indentation does not extend beyond the third vein..... 10
- 9. Marginal cell with two hyaline indentations, the first just beyond the tip of the first longitudinal vein..... (1) *johnsoni*
- This cell with only one hyaline indentation..... (2) *opaca*
- 10. Wings brown at base..... (7) *maculata*
- Wings hyaline, at least as far as the humeral cross-vein..... 11
- 11. Second posterior cell with a large rounded indentation which occupies much of its area, in addition to the sub-apical band (10) *trixa*
- Basal part of the second posterior cell occupied by two indentations, which may or may not be joined above to form an inverted V..... (9) *bigeloviae*

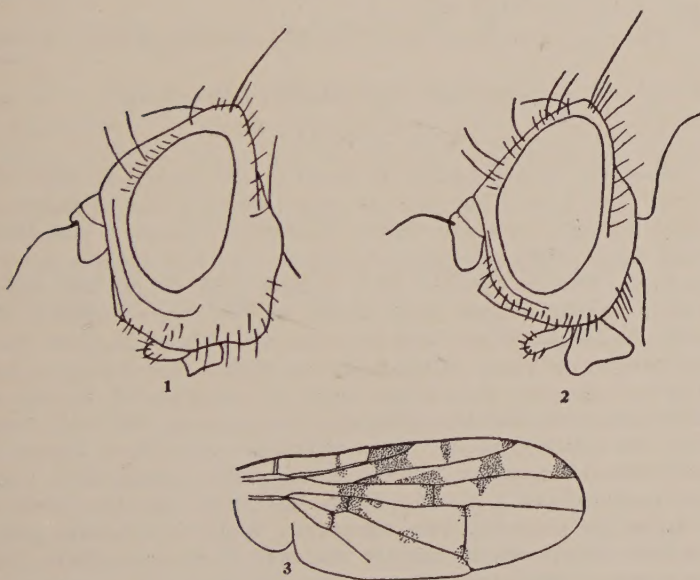


Fig. 1. *Tephrella euarestoides* n. sp., profile of head.

Fig. 2. *Tephrella trixa* (Curran), profile of head.

Fig. 3. *Tephrella semilucida* n. sp., wing.

1. *TEPHRELLA JOHNSONI*

Acidia (?) *johnsoni* Thomas, 1914, p. 426, f. 34.

Only two pairs of lower and one of upper orbital bristles (all colorless) are apparent in the type, but it may be that the scars of others have been overlooked, as the specimen is not in very good condition. The second and third veins are quite straight, the third vein bare. The sixth abdominal segment of the female is approximately equal in length to the fifth. Length of wing, 3.5 mm.

Only the type, which is in the M.C.Z., has been seen. It is labelled simply "Colo."

2. *TEPHRELLA OPACA*

Aciura opaca Coquillett, 1899, p. 263; Aldrich, 1905, p. 607.

Aciurina opaca Curran, 1932, p. 10.

The unique type of this species agrees closely with the type of *johnsoni*, except for the absence of the first hyaline indentation in the marginal cell.

The type, which is in the U.S.N.M., comes from Elko, Nevada.

3. *Tephrella euarestoides* Bates, n. sp.

(Fig. 1)

Female: Front yellow, as broad at the vertex as high, narrowed anteriorly; one pair of upper orbitals, two of lower, all fine, yellowish. Antennæ yellow, third joint rounded, a little longer than wide, arista yellowish; face grey, the oral margin not projecting. Thorax overlaid with a dark grey pollen, the dorsum rather thickly clothed with stubby whitish hairs; bristles fine, yellowish, arranged as usual in the group. Scutellum black above, reddish on the sides, thinly pollinose, with a few marginal hairs and a single pair of bristles. Legs yellow, with the femora and tibiae somewhat darker. Abdomen shining black, with only a very few fine colorless hairs. Sixth abdominal segment of female approximately equal in length to the fifth. Ovipositor sheath (seventh segment) shining black, somewhat tapering, about as long as the preceding two segments. Wing dark brown, with a hyaline pattern almost exactly like that of *Euaresta bella*; third vein naked above, bowed upward beyond the small cross-vein, the small cross-vein over the outer third of the discal cell.

Total length, 4.5 mm.; length of ovipositor sheath, 0.7 mm.; length of wing, 3.5 mm.

Type, one female, in the author's collection, from Ridgway, Colo., 7000 ft., June 23-30, 1928, received from Prof. John L. Buys.

4. TEPHRELLA LUTEA

Aciura lutea Coquillett, 1899, p. 264; Aldrich, 1905, p. 607.

Aciurina lutea Curran, 1932, p. 10.

Three lower and two upper pairs of orbital bristles well developed, dark. Second longitudinal vein almost straight, the third but slightly bowed, course of the fourth vein, however, more irregular; third vein bearing only a few bristles at base. Length of wing, 4 mm.

This species, because of its shining thorax and light brown wings, presents a very different appearance from that of its congeners.

The type of *lutea* is accompanied by a piece of woody stem, with a small gall-like swelling on one side; the plant is not identified. This is a different type of gall from the distinct round structures formed by most of the other species of the genus.

I have seen only the type, from Parea, Utah, and a male from Ormsby Co., Nevada (July 6, Baker), both in the U.S.N.M. Professor Aldrich kindly lent me the latter specimen for study.

5. TEPHRELLA APLOPAPPI

Aciura aplopappi Coquillett, 1894, p. 72; Aldrich, 1905, p. 607.

Aciurina aplopappi Curran, 1932, p. 10.

In the male examined, only two pairs of lower orbitals are apparent, but in the female co-type, now in the M.C.Z., there are five lower orbitals on one side, three on the other, all fine and dark; posterior upper orbital white, stumpy. Second longitudinal vein slightly waved on its outer half; third vein very strongly bowed upward beyond the small cross-vein, bearing a few scattered bristles above, mostly on the outer half; both basal and distal sections of the fourth vein waved; cross-veins oblique, convergent; hyaline maculation much reduced, there being two hyaline indentations in the costal cell, two in the marginal cell, two or three in the second posterior cell, a round spot in the first basal cell, another in the discal cell, and several in the third posterior cell. Length of wing, 3.5 mm.

The types were bred from elongate galls on *Aplopappus pinifolius*. This gall differs from those of the following species in being a swelling of the stem (like miniature galls of *Eurosta solidaginis*), rather than an axillary bud gall.

One of the five National Museum types was given to the M.C.Z. in exchange. There is some additional material in the U.S.N.M. from the type locality, Los Angeles County, California.

6. TEPHRELLA THORACICA

Aciurina thoracica Curran, 1932, p. 11, f. 3.

Three well developed pairs of dark lower orbitals; posterior upper orbitals white. Venation much as in *aploppapi*, except that the small cross-vein is about perpendicular to the third vein, not oblique; third vein sparsely bristled for its entire length above. Length of wing, 5.5 mm.

Curran informs me that his figure is inaccurate, as the type has two hyaline indentations in the third posterior cell, which are not indicated there: a character shared by all of the specimens that I have seen. The two hyaline indentations in the second posterior cell may be separate, as in Curran's figure, or may be connected above, to form an inverted V.

Besides the type from San Diego County, California, I have seen the following specimens: 1 ♂, Phoenix Lake, Marin Co., Calif., May 20 1927 (H. H. Keifer), and 1 ♀, Carmel, Calif., June 5, 1927 (L. S. Slevin), in the collection of the California Academy of Sciences; 1 ♀, Stanford University, Calif., 3, Oct., 1903, in the U.S.N.M.; 1 ♂, same data (from W. M. Mann), in my collection; 1 ♂, Niles Canyon, Calif., July 15, 1916 (E. P. Van Duzee), in the M.C.Z.

7. TEPHRELLA MACULATA

Aciura maculata Cole, 1919, p. 252, pl. 19, f. 27; Cole & Lovett, 1921, p. 325, f. 43.

Aciurina maculata Curran, 1932, p. 10.

Aciurina pacifica Curran, 1932, p. 10, f. 4.

First pair of lower orbitals and second pair of upper orbitals colorless, weak, the other two pairs of lower and the first pair of upper orbitals fine, dark, well developed. Third vein bearing scattered bristles for its entire length above, while below there are none beyond the small cross-vein. Length of wing, 4 mm.

The two female paratypes lent me by Cole show the wing pattern of Curran's *pacifica*: that is, the hyaline marks of the second posterior cell are fused to form a triangle. One of the Nevada specimens, however, shows a small dark patch in the middle of this triangle, making the inverted V of Cole's figure.

The Nevada specimens are accompanied by a greyish, slightly pubescent stem gall, about 8 mm. in diameter, placed on the side of the twig, as are the galls of *bigeloviae*, *trixa* and so forth. The record "from fruits of *Amelanchier*" is surely an error, as the fruit feeding habit is quite unknown in the section of the Trypetidæ to which these species belong.

Besides the two paratypes from Jackson Co., Oregon, there is a female from Yreka, Calif., May 13, 1932 (E. O. Essig), in the collection of Mr. Cole, which bears the label "*Artemisia tridentata*." Five specimens from the U.S.N.M. are from Glenbrook, Nevada, June 10 and June 15, 1916 (H. G. Dyar).

8. TEPHRELLA FERRUGINEA

Aciura ferruginea Doane, 1899, p. 182, pl. III, f. 6; Aldrich, 1905, p. 607; Janes & Thomas, 1932, p. 103.

Aciurina ferruginea Curran, 1932, p. 10.

The orbital bristles (three lower and two upper pairs) are colorless in this, as in all of the following species. The proportions of the front vary according to locality: the front is distinctly wider in specimens from Washington, Oregon and Colorado, than in those from New Mexico, Nevada and Wyoming. Curran (1932, p. 16) has described a species (*Eutreta frontalis*) on a similar character, and I have noticed such variation in some other Trypetidæ. *T. ferruginea* also shows some variation, largely individual, in the number and size of the spots in the third posterior cell; otherwise the wing pattern seems quite constant. Length of wing, 4 mm.

I have seen no breeding records of this species, but several of the specimens, from different sources, bear labels "taken on *Chrysothamnus*."

There are fifteen specimens of this species before me, from the Philadelphia Academy of Natural Sciences, the Museum of Comparative Zoology, and the private collections of F. R. Cole, J. Wilcox and myself. The data are: Washington: Naches

(August), Yakima (July); Oregon: Long Creek (September), Prineville (3100 ft., August), 14 mi. E. of Sisters (3100 ft., August); Colorado: Creede (8800 ft., August); New Mexico: Therma (August); Nevada: Ormsby Co. (July); Wyoming: Big Horn Co. (6500 ft., August). The National Museum specimens, which were not studied, are from Nevada (Ormsby Co.), Colorado (Summit Co.) and Utah (Mintah and Salt Lake).

9. *TEPHRELLA BIGELOVIAE*

Trypeta bigeloviae Cockerell, 1890, p. 324; Cockerell, 1893, p. 112.

Trypeta bigeloviae var. *disrupta* Cockerell, 1890, p. 324.

!*Trypeta* (*Eurosta*) *bigeloviae* [n. sp.] Townsend, 1893, p. 49.

Trypeta bigelovii [sic] Baker, 1895, p. 174.

Aciura bigeloviae [sic] Caudell, 1902, p. 37.

Eurosta bigeloviae Aldrich, 1905, p. 609.

This and the following species are very similar in structure and appearance. *T. bigeloviae* seems in general somewhat larger and darker, and the wing character used in the key seems always to distinguish it. The two hyaline dashes of the second posterior cell may be connected above, or separate, in specimens from the same locality, so that there seems to be no reason for recognizing Cockerell's name *disrupta*. The abdomen may be red or yellow; the legs are wholly yellow; the ovipositor sheath is black. Length of wing, 4—5 mm.

This species makes large, white, wooly galls on *Bigelowia*, while those of *trixa* are much smaller, dark brown, and smooth.

I have seen twelve specimens of this species, all from the National Museum. Six of these are the specimens reported by Caudell, from Platte Canyon, Colorado, June; one is labelled "Washington, D. C., May 25, 1898"; the others are without locality. The Washington record seems very doubtful.

10. *TEPHRELLA TRIXA*

(Fig. 2)

Aciurina trixa Curran, 1932, p. 11, f. 5.

Aciura bigeloviae Janes & Thomas, 1932, p. 103 [err. det. ?]

Second longitudinal vein only very slightly waved; third vein bearing a few spines (five or six) widely scattered over its whole length above, and three or four at the base below; anal cross-vein very nearly parallel with the basal cross-vein, not oblique as in

bigeloviae, so that the anal cell is only very slightly drawn out on the sixth vein. One specimen (from Idaho) has an indication of a spur on the fourth vein, just beyond the hind cross-vein.

Curran's figure gives a good idea of the wing pattern of this species; it is remarkably constant. In the Idaho specimens, the hyaline spot in the discal cell is larger than in southern specimens, usually touching the fourth and fifth veins above and below. The other spots show some individual variation in proportion and relative size, but their position and form is quite constant. The color of the abdomen is very variable: it may be red (as in the type), yellowish, red with black lateral markings, or (rarely) entirely black. There seems to be no correlation between abdomen color and locality. Length of wing, 4 mm.

The galls of this species are small, 4 to 8 mm. in diameter, smooth, often with a waxy appearance, placed on the side of small twigs. The host, according to labels on the specimens before me, is *Bigelovia* or *Chrysothamnus*.

I have seen 88 specimens and numerous galls from Idaho: Weiser (April 26 to May 12, 1909, J. M. Aldrich); Nevada: Reno (May, 1916, H. G. Dyar); Utah: Am. Fork, Pangultch (June 27, 1927, G. F. Knowlton), Logan, Salt Lake City (April, 1918, L. P. Rockwood); New Mexico: Santa Fe (July 21, 1926, E. C. Van Dyke); California: Independence, Inyo Co. (June 12, 1929, R. L. Usinger). This material is from the National Museum, the collection of the California Academy of Sciences, of F. R. Cole, and my collection.

11. *Tephrella semilucida* Bates, n. sp.

(Fig. 3)

Male and female. Front yellowish, somewhat broader than high, the proportions being about 3 : 2.5. All head bristles colorless; three pairs of lower orbitals, the first pair feebly developed, and two of upper. Third antennal joint short, rounded. Face projecting forward above the oral opening; cheeks wide, especially the post-genæ.

Thorax grey, sparsely clothed with stumpy white hairs; bristles colorless. Scutellum concolorous with dorsum of thorax. Legs entirely yellow, with all the spines and hairs colorless. Abdomen varying from black to red, intermediate specimens having dorso-lateral black marks on each segment; as in the other species of

the genus it is shining, bearing a few scattered colorless hairs; fifth segment about one and one-half times as long as sixth in the female; ovipositor sheath (seventh segment) black, trapezoidal, about twice as wide at base as at tip and about as long as wide at base. Wing hyaline, marked with a variable amount of brown along and between the veins; first longitudinal vein curving gradually to the costa, making the stigmal cell much longer than in the similar *T. notata*; second vein very slightly waved; third slightly bowed up beyond the small cross-vein bearing nine or ten spines scattered along most of its length above, and a few near the base below; cross-veins approximated, about parallel; hind cross-vein bowed out; basal and anal cross-veins straight, about parallel, the anal cell being thus cut short. The pattern includes a cross-band in about the middle of the costal cell; base of the marginal and first basal cells marked with a variable amount of brown which extends below to cover the basal cross-vein and sometimes the anal cross-vein as well; stigma and the marginal cell below it dark; apical part of the marginal cell may include one, two or three dark areas. A brown band which borders the wing tip between the second and fourth veins may be entire or may be represented only by a spot at the end of the third vein; the small cross-vein included in a brown spot of variable size, sometimes extending across the discal cell below. A spot on the outer third of the submarginal cell may extend across the first posterior cell to include the hind cross-vein, or it may be reduced to a few isolated patches.

Total length (♀), 4.5 mm.; length of wing, 4 mm.; length of ovipositor sheath, 0.5 mm.

Described from 7 ♀♀ and 5 ♂♂ from Riparia, Washington, May 7th to May 19th, 1908 (J. M. Aldrich), bred from galls on *Bigelowia*. Holotype ♀ and allotype ♂ in the U.S.N.M.

The gall is small (4 mm. in diameter), round and smooth, very like the galls of *T. trixa*.

This species is similar to *T. notata*; the wing pattern of both species varies in a similar way. The shape of the stigmal cell, as pointed out in the key, serves conveniently for separating them. The galls are quite distinct.

12. TEPHRELLA NOTATA

Trypeta notata Coquillett, 1899, p. 262; Aldrich, 1905, p. 605; Cockerell, 1900, p. 198.

This species is very similar to *semilucida* in structure. In the type, and in some other specimens probably from the type lot, the wing pattern is reduced to a few small brown spots as

described by Coquillett. In the series from Santa Fe, however, the wing markings are much more completely developed, both along and between the veins. I cannot find any grounds for making two species, however, even though the differences between extreme specimens are quite striking. Length of wing, 4 mm.

The gall of this species is much larger than that of *semi-lucida*, 18 to 20 mm. in diameter, and somewhat pubescent.

Besides the types, I have seen 7 specimens from Santa Fe, New Mexico, June 5, bred from galls on "*Bigelovia chrysothamnus*" by H. S. Barber.

LITERATURE CITED

Aldrich, J. M.

1905. A catalogue of North American Diptera. Smiths. Misc. Coll., XLVI, No. 1444, 680 pp.

Baker, C. F.

1895. Biological notes on some Colorado Diptera. Ent. News, VI, pp. 173-174.

Bates, M.

1933. Notes on American Trypetidæ, II. Psyche, XL., pp. 48-56, 4 figs.

Bezzi, M.

1913. Indian Trypaneids (fruit flies) in the collections of Indian Museum. Mem. Ind. Mus., Calcutta, III, pp. 53-175, pl. VIII—X, 3 figs. in text.

Caudell, A. N.

1902. Notes on Colorado insects. U. S. Dept. Agric., Div. of Ent., Bull. 38 (n.s.), pp. 35-38.

Cockerell, T. D. A.

1890. *Trypeta bigeloviæ*, n. sp. Ent. Mo. Mag., XXVI, p. 324.
1893. *Trypeta*, *Clisiocampa* and *Ammalo*. Can. Ent., XXV, p. 112.
1900. Note on *Trypeta notata*. Jl. N. Y. Ent. Soc., VIII, p. 198.

Cole, F. R.

1919. In Cole & Lovett, New Oregon Diptera. Proc. Calif. Acad. Sci., (4), IX, pp. 221-255, pl. 14-19.

Cole, F. R. and Lovett, A. L.

1921. An annotated list of the Diptera of Oregon. Proc. Calif. Acad. Sci., (4), XI, pp. 197-344, 54 figs.

- Coquillett, D. W.
1894. New North American Trypetidæ. Can. Ent., XXVI. pp. 71-75.
1899. Notes and descriptions of Trypetidæ. Jl. N. Y. Ent. Soc., VII, pp. 259-268.
- Curran, C. H.
1932. New species of Trypaneidæ, with key to the North American genera. Am. Mus. Novitates, No. 556. 19 pp., 9 figs.
- Doane, R. W.
1899. Notes on Trypetidæ with descriptions of new species. Jl. N. Y. Ent. Soc., VII, pp. 177-193, pls. III, IV.
- Hendel, F.
1914. Die Gattungen der Bohrfliegen. Wien. Ent. Zeit., XXXIII, pp. 73-98.
1927. Trypetidæ, in Lindner, die Fliegen der palæarktischen Region, 49, 221 pp., 17 pls., 79 figs. in text.
- Janes, J. and Thomas, W. L.
1932. Notes on Utah Trypetidæ. Utah Acad. Sci., IX, pp. 103-104.
- Thomas, F. L.
1914. Three new species of Trypetidæ from Colorado. Can. Ent., XLVI, pp. 425-429, 3 figs.
- Townsend, C. H. T.
1893. A trypetid bred from galls on Bigelovia. Can. Ent., XXV, pp. 48-52.
-

MACROVELIA HORNI Uhler

While traveling on the Placerville road just east of Folsom, during the afternoon of May 5, 1935, the auto suddenly began to strike numerous small flying insects. This occurred on both sides of a small creek bed for over a hundred yards. Mr. E. P. Van Duzee determined captured specimens as the above and stated that the species is consistently found near water. Similar swarms were subsequently encountered in lower Amador County among the hills on May 21. On May 5 the air in the Folsom locality was full of countless numbers which were flying generally away from the creek. On striking the auto windshield they left hardly any mark, which produces the suggestion that motoring entomologists should attempt to substitute this creature for the kinds that hit and splash or stick.—H. H. Keifer, California State Department of Agriculture.

TWO REMARKABLE BLIND BEETLES FROM
NORTHEASTERN OREGON

(Carabidæ, Leiodidæ)

BY MELVILLE H. HATCH

Late in June of 1933 my good friend, Mr. M. C. Lane of Walla Walla, Washington, was on his vacation collecting beetles in the dense evergreen forest back of Seaside, on the coast of Clatsop County in extreme northwestern Oregon. He was after "big game." And he got it.

The previous September Mr. Lane had taken in the same locality a single specimen of the remarkable blind pterostichid, *Anilloferonia* Van Dyke, but he had not recognized his prize until he got home. Now he was back after more. He found them!

In small rodent tunnels under twelve or fourteen inch logs sunk two-thirds of their diameter in the damp forest floor, the remnants of a long deserted lumber camp, Mr. Lane took a series of the *Anilloferonia*, which proved to be distinct from Van Dyke's species described from Mt. Adams. What is more extraordinary still, he found in the same situation two specimens of an undescribed blind genus of Leiodidæ, the first blind representative of this family to be discovered outside of the highly specialized trimerous Scotocryptini, which are confined to the nests of bees in the Neotropics. Accompanying the pterostichid and the leiodid were two specimens of the scarabacid, *Ægilia* (*Leptægialia*) *montana* Brown, not blind, but of the same rufo-testaceous color as the others. In addition, specimens of the burrowing *Pterostichus* (*Leptoferonia*) *longicollis* LeC. were abundant, but for the most part occurred at a lesser depth than the more noteworthy species.

ANILLOFERONIA Van Dyke
(Pan-Pac. Ent., II, 1926, p. 115)

Eyes wanting*; form parallel; basal pronotal impressions single; sides of pronotum with a single seta in front of middle; elytra without dorsal punctures; metepisternum short; apterous. Testaceous; antennæ extending beyond base of pronotum; pronotum very nearly as long as wide, with base and apex nearly

*Along the anterior margin of each ocular area in our specimens is a small white spot of uncertain nature. Perhaps it is a rudimentary eye, although there is no clear evidence of facets in connection with it.

equal in width, the sides feebly arcuate; elytra nine-striated, the striae impressed and very finely and not closely punctate; scutellar stria absent; side pieces of meso and metasterna and first two abdominal sternites somewhat punctate.

- A. Sides of pronotum arcuate in anterior half, straight, slightly convergent and not sinuate posteriorly; hind angles barely obtuse; basal impressions single, not well defined; basal area of pronotum obscurely punctate; humeri rounded; prothorax below apparently not punctate; length 5.5 mm. Washington (Mt. Adams, 4000 feet).....*testacea* Van D.
- AA. Sides of pronotum feebly arcuate anteriorly, thence feebly sinuate and nearly parallel in about basal sixth, the hind angles narrowly rectangularly to subacutely rounded; basal impressions linear, well defined, distinctly punctate; humeri dentate; no ocellate seta-bearing puncture at base of second stria; prothorax below on either side evidently sparsely punctate; three basal protarsal segments broader in male than in female; male with and female without a small flat opaque area in middle of posterior portion of last abdominal sternite; length 5-6 mm. Oregon (Seaside).....*lanei* Hatch sp. nov.*

Typhroleiodes subterraneus Hatch gen. et sp. nov.

Typhroleiodes Hatch, gen. nov.

A new genus of Leioididae apparently related to *Hydnobius*, but distinguished therefrom by the absence of eyes and a truncate labrum. Body not contractile; head moderate, without antennal grooves beneath; labrum short, truncate; antennae with five segmented club, the eighth segment smaller than the ninth and seventh; pronotum subrectangular, transverse; procoxae transverse, prominent, with evident trochantin; procoxal cavities not or very narrowly closed behind; mesocoxal widely separated from elytral epipleurae; metacoxae separated; tarsi five segmented; tibiae along outer margin more or less minutely spinose, without a dorsal carina. Type: *T. subterraneus* sp. nov.

Typhroleiodes subterraneus Hatch, sp. nov.

Uniform rufo-testaceous, shining; head transverse, finely sparsely regularly punctate, the frontal and epicranial sutures faintly indicated, the region in front of the frontal suture transversely strigose, the vertex alutaceous except for the ocular areas which are strigose, the anterior edge very finely margined; labrum short truncate, the surface behind the middle of the front margin elevated to form a prominent tooth; antennae setose, not quite

*Type male, allotype female, and two paratypes (in Hatch collection): Seaside, Ore. (June 28, 1933. M. C. Lane col.) Paratypes same data as type, in Lane collection. One paratype, same data as type but dated September 4, 1932, in Lane collection.

extending to the base of the pronotum, the five segments of the club opaque and pubescent, the six basal segments devoid of short pubescence, the eighth segment narrower and shorter than either the ninth or seventh; pronotum as wide as elytra, its side margins continuous with the elytra and similarly evidently beaded; pronotum about three-fourths as long as broad, the apex nearly three-fourths as wide as the base, the sides arcuate convergent in front of middle, behind the middle the sides are subparallel and feebly sinuate in basal third, hind angles rounded, the base very finely beaded, the disc alutaceous, finely sparsely regularly punctate with a few larger punctures arranged as follows: five along either side margin, one close to the front margin on either side of the middle, two or three in a longitudinal series about midway between the side margin and the middle, one on either side of the middle towards the apex and a transversely arranged pair on either side of the middle towards the base; elytra not alutaceous, more shining and more coarsely punctate than head and pronotum, the punctures extremely faintly aggregated into about twenty longitudinal series, the alternate series very faintly impressed, the entire stria arrangement so feeble that at first glance or in certain lights no evidence of longitudinal series may appear; elytral epipleura wide, shining, transversely strigose, impunctate except for a series of punctures along the inner margin; pro-, meso-, and metasterna carinate at middle, sparsely coarsely punctate and alutaceous; prothoracic epipleura smooth and sparsely punctate towards outer margin, alutaceous or finely strigose within; abdominal sternites five, sparsely coarsely punctate and alutaceous; trochanters small, the metatrochanters less than one-fourth the length of the meta-femur; femora obliquely finely strigose, punctate, shining; tibiae finely spinose along outer margin, the protibiae straight along outer margin, arcuate along inner margin, the apex nearly half as wide as the tibia is long and about five times as wide as is the tibia at its base; basal segment of the protarsus elongate oval, nearly as long as the rest of the tarsus exclusive of the claws, nearly two-fifths as wide as long, the under surface concave and set with whitish spongy pubescence; length 3.1-3.75 mm.

Type and paratype: Seaside, Ore. (June 28, 1933. M. C. Lane col.), in Hatch collection.

If these specimens are males, as the protarsi would appear to indicate, the genus they represent becomes anomalous in the tribe Leiadini (sensu Reitter, Hatch, etc.), being the only one with strongly sexually dimorphic protarsi and a five segmented male abdomen.

Acknowledgments are due to Mr. M. C. Lane for the privilege of studying this noteworthy material, for the use of his observa-

tions on the type of *Anilloferonia testacea* Van D., and for his generosity in permitting me to retain the types for my collection. I regard the two specimens of *Typhloleiodes* as by far the choicest beetles in my entire cabinet.

**MONILLIPATROBUS HATCH A SYNONYM OF
PSYDRUS LeC. (CARABIDÆ)**

BY MELVILLE H. HATCH

Monillipatrobus punctatus Hatch (Pan-Pac. Ent. IX, 1933, pp.118-119) is a synonym of *Psydrus piceus* LeC., as pointed out to me by Mr. M. C. Lane and Dr. Fritz van Emden and established through a comparison with the LeConte type through the courtesy of Mr. P. J. Darlington, Jr. My error was due to the fact that all recent descriptions of *Psydrus* (Horn, Trans. Am. Ent. Soc., IX, 1881, pp. 124, 131; LeConte and Horn, Class. Col. N. Am., 1883, pp. 21, 26; Dupuis, Gen. Ins., 123, 1911, p. 1; Bradley, Man. Gen. Beetles Am. n. of Mex., 1930, p. 26) refer to the scrobe of the mandible as without a setigerous puncture, when the fact is that such a puncture is present, even in LeConte's type. Moreover, the first three of these authors as well as LeConte, Class. Col. N. Am. 1861-1862, pp. 17, 29, 30, describe the first four segments of the antennæ as glabrous, whereas in reality no more than the basal segment is properly so described, and even it bears a certain number of short as well as long setæ. A brief reference to Horn's table (l.c., p. 124) will show why I placed the beetle in Pogonini. Sloan (Trans. Ent. Soc. London, 1923, p. 247), followed by Bradley, placed the genus, together with *Nomius*, in Pterostichini, in part on the basis of the presence of a plica on the under surface of the elytra, said to be absent in Pogonini (Trechini).

Nomius and *Psydrus* are closely allied. They are distinguished from the Pterostichini by the punctate mandibular scrobe and small metatrochanters and from the Pogonini by their submonilliform antennæ. They may be distinguished from each other as follows:

- A. Eyes large, the head narrowed directly behind them, without appreciable postocular tempora; antennal segments one to four without or with only a very few of the numerous fine setæ that beset the other segments, but with a few longer

setæ; body more convex, more finely punctate, shining; hind angles of pronotum bidentate.....*Nomius* Lap.

- A¹. Eyes small, with an oblique postocular tempora that is nearly one-half the length of the eye; first antennal segment with only a few of the fine setæ that densely beset the other segments; body more depressed, more coarsely punctate, pronotum and elytra alutaceous; hind angles of pronotum simple, distinct, slightly obtuse.....*Psydrus* LeC.

Nomius pygmæus Dej. has a wide distribution in both southern Europe (Greece, Bosnia, Hungary, Corsica, Sardinia, southern France) and North America (Quebec to Georgia and Alabama, Ontario, Michigan, Wisconsin, Colorado, British Columbia to California). The beetles live under stones and logs and exhale a strong fetid odor. In mid-summer in the Pacific Northwest they frequently get into residences, factories, hospitals, etc., attracted by lights at night, and become a nuisance.

Psydrus piceus LeC. was described from Lake Superior, where Hubbard and Schwarz (Proc. Amer. Philos. Soc. XVII, 1878, p. 629) record it from Eagle Harbor, Keewenaw Co., Michigan. In the west it is recorded from Anyox, B. C. (Brown, 25th and 26th Rep. Quebec Soc. Protec. Plants, 1934, p. 146 [Ent. Rec., 1931, 1932, 1933, p. 6]) and northern California (Horn, l.c., p. 131) and I have seen specimens from Idaho (Cedar Mt. near Moscow, M. C. Lane), Washington (Mt. Adams, 3000 ft., M. C. Lane; Kautz Creek on Mt. Rainier; Seattle; Sultan) and Oregon (near Oregon Caves, 4000 ft.). The beetles live under the bark of logs.

SYMPHRASIS SIGNATA HAGEN

During the spring of 1934 and again in 1935 an outbreak of *Xylomyges curialis* Grote occurred in the Woodlake district of California. In dissecting the pupæ of the *Xylomyges* taken from beneath citrus trees several disc-shaped cocoons were found within the pupal skin. These contained larvæ very comparable to ant lions in shape. About 14 months after collection a species of mantispid emerged from the cocoons which has been identified by Mr. E. P. Van Duzee of the California Academy of Sciences as *Symphrasis signata* Hagen.—R. S. Woglum.

BRITISH COLUMBIAN RECORDS OF CARABIDÆ
AND HYDROPHILIDÆ¹

(Coleoptera)

BY HUGH B. LEECH

A number of the records here given are additions to the Provincial list, and as several of the species have been introduced, their captures are of interest in supplementing recent papers by Hatch (5, 6) and and Blackwelder (1).

CARABIDÆ

GEHRINGIA OLYMPICA Darl.

This species, recently described by Darlington (4) as from near Sol Duc Hot Springs, Olympic Mts., Washington State, and Glacier Park, Montana, has turned up at Stanley, 17.VI.'32 (K. Graham) and at Fernie, 25.VII.'34 (H. Leech). Taken by throwing water onto gravel bars. The identification has been verified by Mr. Fall.

CARABUS NEMORALIS Mull.

I have not seen a specimen from this province carrying a date earlier than that of 1923. The species does not occur in the lists of Taylor (8, 9) or Wickham (12). Mr. A. W. Hanham of Duncan collected at Victoria from 1901 to 1906 but did not find *nemoralis* Mull., while Mr. W. Downes made special efforts to add to the Carabid records there in 1917, 1918, and 1920, but did not take this species.

In the collection (now at the University of Illinois) of the late K. F. Auden, *C. nemoralis* Mull. is represented as follows (all collected by Auden):

1, Victoria, 6.VII.'23; 9, Victoria, 15.III.'24; 2, Victoria, 16.III.'24; 1, Victoria, 17.III.'24; 1, Vancouver, 25.II.'24; 2, Vancouver, April, 1925; 1, Vancouver, 12.V.'25; 1, Vancouver, 25.V.'25.

There are also specimens of Auden's Victoria (17.III.'24) series in Mr. Hopping's collection.

By 1926 the species was very abundant over much of Vancouver, and in 1929 had begun to enter the University area of Point Grey. I have seen specimens from Port Haney, about

¹ Contribution from the Division of Forest Insects, Entomological Branch, Department of Agriculture, Ottawa, Canada.

twenty miles up the north bank of the Fraser River from New Westminster; but it has not yet reached Agassiz, sixty miles up river, according to Mr. R. Glendenning of the Dominion Entomological Laboratory there. In fact I have no record of *memoralis* having been taken on the south side of the Fraser valley.

The only records from the interior of the province are from Salmon Arm, which is by railroad rather more than 350 miles from Vancouver. This district is over a slight height of land from the north end of the Okanagan Valley, and, with an annual precipitation of about 18 inches, is just out of the dry-belt region. *C. memoralis* Mull. was first taken on 2.V.'33 (C. G. Smith) and on 12.IV.'34, I caught a very fresh male running along the sidewalk under a street light. Additional specimens of both sexes have been taken, and the species seems to be well established. It is probable that freight cars, especially of the open cattle-car type, were the means of the beetles spreading so far inland; Salmon Arm is on the main line of the Canadian Pacific Railway.

Two places which are in direct and constant boat communication with Victoria and Vancouver, are Nanaimo and Prince Rupert; but no *memoralis* have been recorded from either locality. Nor did Carr (3) find it in northern Alberta.

PTEROSTICHUS (LEPTOFERONIA) LONGICOLLIS Lec.

Duncan and Haney (Leech Coll.) Determined by Dr. Van Dyke.

PTEROSTICHUS (OMASEUS) VULGARIS L.

Victoria, 23.VIII.'33 (Downes); Vancouver, May, 1931, 10.X.'32, 22.X.'32, (Leech). An introduced species.

PTEROSTICHUS (MELANIUS) CAUDICALIS Say.

Creston, Wynndel (Stace-Smith); Oliver (Auden). The identifications of this and the four species following have been verified by Mr. Alan Nicolay.

PTEROSTICHUS (MELANIUS) LUCTUOSUS Dej.

Pender Harbor, Oyama, Vernon, Oliver (Hopping coll.); Salmon Arm, White Lake (Leech coll.).

PTEROSTICHUS (MELANIUS) CORVINUS Dej.

Okanagan Falls, Osoyoos (Hopping).

PTEROSTICHUS (DYSIDIUS) MUTUS Say.

Pender Harbor, Mara (Hopping coll.); Agassiz, Salmon Arm (Leech coll.).

PLATYSMATUS NITIDUM Kby.

Osoyoos, Oliver (Hopping coll.); Salmon Arm (Leech coll.).

STEREOCERUS HÆMATOPUS Dej.

A single example carrying the label: "Just N. of Ft. St. James, B.C., 3.V.'32 (H. S. Fowler)." Leech collection. Leng apparently does not follow Buchanan's suggestion (2) that *Stereocerus* be removed from the *Amarini* to the *Pterostichini*.

LÆMOSTHENUS (PRISTONYCHUS) COMPLANATUS Dej.

One specimen, Victoria, 12.VII.'30 (E. E. Peden) Leech coll. Determined by Dr. Van Dyke who says that it is "a species of southwestern Europe, introduced along the western coast of both North and South America by the Spaniards over a hundred years ago. It has been gradually extending its range along our coast within recent years."

PLATYNUS HARDYI Lec.

Vancouver, 28.VI.'33 (Leech). Determined by Mr. Fall, who remarks that he does not know of any records of the species having been taken between B. C. and the Maritime provinces.

PLATYNUS (PARAGONUM) BELLERI Hatch

This recently described species (6) has been taken on sphagnum at the edge of a small lake at Steelhead, 5.VII.'34 (K. Graham). The specimens vary from shining æneous to absolutely black.

HARPALUS WASHINGTONENSIS Van D.

Identified by Dr. Van Dyke, who recorded a specimen from Nanaimo in his original description (10). Examples in the Hopping and Leech collections are from Cowichan Lake, Pender Harbor, Vancouver and Steelhead.

HYDROPHILIDÆ

SPHÆRIDIMUM BIPUSTULATUM F.

First noted in 1931, at Vancouver and Salmon Arm. This species has become very common at the latter place, where it now almost outnumbers *scarabæoides* L. It is highly probable that the constant hauling of cattle in open railway cars is a major factor in distributing certain species of *Sphaeridium*, *Cercyon*, and *Aphodius* in Western Canada.

SPHÆRIDIMUM SCARABÆOIDES L.

Common throughout the southern portion of B. C. This species is exceedingly numerous in cow and horse dung, while *bipustulatum* F. is usually taken on the wing.

CERCYON UNIPUNCTATUS L.

Salmon Arm; not rare; March to May, when it can be taken in flight in barnyards.

CERCYON QUISQUILIUS L.

Very common. Salmon Arm, Vancouver, Vernon.

CERCYON PRÆTEXTATUS Say

Rare. Peachland (Wallis, 11).

CERCYON ADUMBRATUM Mann.

Steelhead, May, in human faeces. Determined by Mr. Fall who says that these specimens, with the elytral intervals distinctly punctate, are identical with examples of *adumbratum* in the Leconte collection, which were sent by Mannerheim himself.

CERCYON ANALIS Payk.

Vancouver, Steelhead, Salmon Arm (Leech coll.). Pender Harbor (Hopping coll.). Taken under rotted straw in March, and flying in April, at Salmon Arm. Vancouver examples are dated February and March. The identification has been verified by Mr. Fall. Blackwelder apparently missed Keen's record (7) in preparing his paper on the species of the Pacific Coast.

MEGASTERNUM POSTICATUM Mann.

Vancouver, Steelhead, Pender Harbor.

CRYPTOPLEURUM MINUTUM Fab.

Duncan, Mara, Sugar Lake, Merritt (Hopping); Steelhead, Vancouver, Salmon Arm, Fernie (Leech).

Acknowledgments. Several British Columbian collectors have contributed data on *Carabus nemoralis* Mull. Mr. H. C. Fall, Dr. E. C. Van Dyke, and Mr. Alan Nicolay have been kind enough to identify, or to verify my determinations of the *Carabidae* mentioned in their papers; while Mr. Fall and Mr. R. E. Blackwelder have done the same for some of the *Sphæridiinae*. Dr. H. H. Ross of the Illinois States Natural History Survey sent me the records of *C. nemoralis* Mull. from the Auden collection. I am very grateful to these gentlemen, and to Mr. Ralph Hopping for permission to examine specimens in his collection.

LITERATURE CITED

Blackwelder, R. E.

- (1) 1931, Pan-Pac. Ent., VIII, No. 1, pp. 19-32.

Buchanan, L. L.

- (2) 1924, Can. Ent., LVI, pp. 40-42.

Carr, F. S.

- (3) 1920, Alb. Nat. Hist. Soc., pp. 1-8.

Darlington, P. J.

- (4) 1933, Pan-Pac. Ent., IX, No. 3, pp. 110-114.

Hatch, M. H.

- (5) 1931, Pan-Pac. Ent., VIII, No. 2, p. 78.

- (6) 1933, Pan-Pac. Ent., IX, No. 3, pp. 117-121

Keen, J. H.

- (7) 1895, Can. Ent., XXVII, No. 7, pp. 165-172.

And No. 8, pp. 217-220.

Taylor, C. W.

- (8) 1884, Can. Ent., XVI, pp. 61-62.

- (9) 1886, Can. Ent., XVII, pp. 34-37.

Van Dyke, E. C.

- (10) 1926, Pan-Pac. Ent., II, No. 3, pp. 113-126.

Wallis, J. B.

- (11) Record in the 54th Annual Rept. of the Ent. Soc. of Ont., 1923, p. 90.

Wickham, H. F.

- (12) 1890, Can. Ent., XXII, pp. 169-172.

A NEW TRIOROPHID FROM DEATH VALLEY, CALIFORNIA

(Coleoptera: Tenebrionidæ)

BY FRANK E. BLAISDELL, SR.*

The remarkable Triorophid described below was collected in Death Valley, Inyo County, California. This valley is the sink of the Amargosa River and lies east of the Panamint Range of Mountains; it is about 150 feet below sea level, and has evidently been once an extensive lake, although now a desert region—a dry, alkaline plain in summer and a mud flat in ordinary winters.

Eschatomoxys Blaisdell, new genus

Head subquadrate; epistoma lobed, lobe triangular and not deflexed, epistomal ridge absent; antennæ long and subfiliform, segments unusually elongate; mandibles stout, bifid at tip, each with a porrect tooth. Eyes distant from the pronotal apex, feebly convex and not more prominent than sides of frons and tempora; a supraciliary carina present. Mentum transverse and hexagonal with bristling setæ near the sides. Labrum retractile. Gula with a deep fusiform impression behind the submentum. Maxillary palpi not visible, completely retractile, or lost in the type; labial palpi small. Pronotum not margined laterally, continuously arcuate with the sides of prothorax. Prosternal intercoxal process arcuate between the coxæ. Intercostal process of abdomen moderately broad and rounded at apex; first segment with a pubescent fovea at middle in the male. Legs long and slender; femora clavate, very slender in basal one-half. Tibial spurs moderate in length and slender. Tarsi long and tenuous, sparsely spinous beneath; claws moderately long and attenuated.

Genotype: *Eschatomoxys wagneri*, new species.

The generic term refers to the unusual form of the antennæ for a member of the Tribe Triorophini. It is a marvelous addition to the known Tentyriid fauna. The species is evidently more or less subterranean in habits. It is hoped that the present study will stimulate collectors to search for other specimens and to discover the female.

Eschatomoxys wagneri Blaisdell, new species

Form elongate ovate, a little more than twice as long as wide, surface smooth, sculpturing feeble to more or less obsolete. Color

*Stanford Medical School and Associate in Research, California Academy of Sciences, San Francisco, California.

piceous with a slight tinge of rufous, posterior one-half of body more evidently rufous; antennæ and legs dark rufous, labrum pale. Luster dull and finely alutaceous. Pubescence extremely sparse and extremely inconspicuous.

Head about one-sixth wider than long and quite equal to length of pronotum; neck somewhat long; equally wide across tempora, eyes and sides of frons, the latter parallel, moderately arcuate and not convergent, angles evenly and strongly rounded, thence transverse and straight to the position of the obsolete cicatrices of the oblique sutures, margin sparsely fimbriate with short hairs; epistomal lobe as in *Stibia*, but not deflexed, moderately convex; sides straight to the obtuse apex, margin irregularly serrulate. Tempora scarcely more prominent than sides of neck, the latter slightly posteriorly convergent, broadly and very feebly sinuate to become parallel. Frons broad, very feebly convex anteriorly, a little more convex on vertex, transversely arcuate and declivous laterally behind the tempora; surface feebly impressed within the supra-antennal convexities; the latter convex antero-posteriorly, and declivous against the eyes; supraciliary margin narrowly and abruptly vertical, obtusely carinate, carinæ extending forward and bounding the preocular impressions within. Surface finely and rather evenly punctate, punctures shallow, not well defined and separated by a distance equal to twice their diameters.

Eyes not in the least prominent, irregularly circular in outline, facets scarcely convex. Antennæ very long and not quite attaining the middle of elytra; segments two to eight inclusive very elongate, cylindrical, each briefly enlarged at apex to receive the condyle of next segment; segments nine, ten and eleven slightly wider; the first elongate, subconical and about five times as long as wide at apex; second six times as long as wide at middle, equal in length to fifth as well as to the combined lengths of ninth and tenth; fourth segment quite equal in length to sixth, seventh or eighth, and seven times as long as wide at middle; ninth obconical, and three and one-half times as long as wide at apex, about one-third of its length shorter than eight; tenth suboblong and about three times as wide at apex as eighth at middle, one-third longer than wide at apex; eleventh fusiform, elongate, four times as long as width at middle and as long as eighth.

Pronotum widest slightly before the middle, one-third wider than long; apex a little wider than base, truncate in very moderate circular arc, not margined except feebly in lateral thirds, angles distinct and not in the least prominent. Sides broadly and feebly arcuate, slightly convergent from apex to base, not margined; viewed from the side feebly margined in apical fourth behind the angles, rendering the latter subacute. Base broadly and slightly arcuate, marginal bead rather coarse and flat, angles obtuse, rendered minutely evident by the bead. Disk transversely convex and arcuately continuous with the hypopleuræ, less so

antero-laterally, the apical angles not entirely visible when viewed from above; slightly convex antero-posteriorly and linearly impressed against the basal bead; punctate as on the frons, punctures slightly better defined.

Prothorac sides less than moderately convex, punctures larger, shallow, not well defined and a little more widely spaced; coxal convexities impunctate. Prosternal apical margin broadly and slightly emarginate, rendering the apical pronotal angles prominent and more acute, as viewed from below; punctures as on the hypopleuræ, but somewhat obliquely impressed rendering their anterior margins more prominent than the posterior; surface slightly asperate.

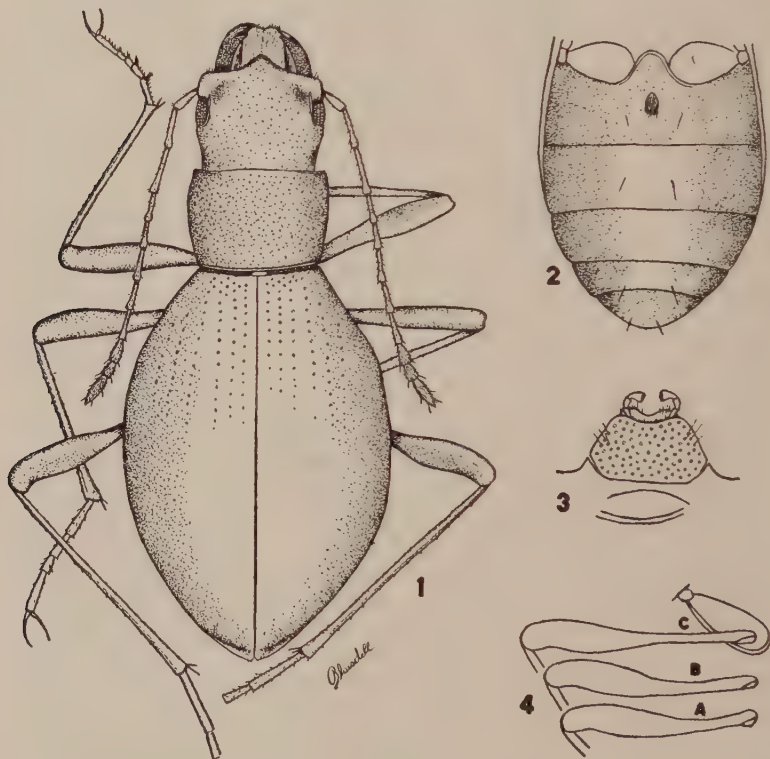
Elytra oval, widest at middle, about one-half longer than wide and nearly four times as long as the pronotum; base equal to that of the pronotum, slightly and broadly emarginate and adapted to the latter, margined, margin slightly irregular and not coarse; humeri obtuse and not in the least prominent. Sides broadly and quite strongly arcuate, more convergent in apical fourth to the obtusely ogival apex. Disk moderately strongly convex in the central area, more strongly, broadly and arcuately declivous laterally, feebly inflexed, the arcuation quite continuous with that of the abdomen; apical declivity gradual and arcuately oblique; apical submarginal impressed area narrow and not extending across the suture. Surface in basal one-fourth with very feebly indicated series of small punctures, that are most evident near base and gradually evanescent posteriorly, otherwise obsolescent.

Epipleuræ narrow, at base as wide as the metepisternum, gradually narrower toward apex; superior margin feeble and slightly irregular from the elytral submarginal punctation; inferior margins distinct but not strong; surface smooth. Mesosternum subasperate, punctures not well defined, close and moderately large. Metasternal punctures rather well defined, moderate in size and separated by a distance equal to two to four times their diameter, and there is a row of small punctures before the metacoxæ. Mesepisternal punctures large and more densely placed, those of the metepisterna small and forming an irregular row along the inner surface. Epimera impunctate, the mesepimera connate with their episternum. Metepimera suboval, as long as wide and interposed between the metacoxæ and the inferior epipleural margins.

Abdomen moderately convex, less so on first segment, impunctate; except in the vicinity of the pubescent fovea, punctures minute, each with a fine, short and inconspicuous hair; a few widely scattered and very minute setigerous punctures are discernable under high power. First segment on median line as long as second and fourth together; second about twice as long as fourth and almost one-third longer than the third.

Legs long and slender, feebly sculptured; femoral punctules very minute and sparse, each with a pale, fine, short and recumbent hair. Tibiæ slightly flattened on their outer surface with widely placed muricate points or minute spicules. Metatibiæ subequal in length to their femur; mesofemora almost one-eighth of their length longer than their tibia; profemora and their tibia quite equal in length. Tarsi slender, a mesotarsus four-fifths as long as its tibia.

Measurements: Length 9 mm.; width 4 mm.



1. *Eschatomoxys wagneri* Blais., new species. Male type.
2. Abdomen showing position of the pubescent fovea at middle of first segment, and what appears to be ambulatorial setae.
3. Mentum and labial palpi with apex of ligula showing; behind the submentum lines indicating boundary of deep gular impression.
4. Femora showing degree of slenderness: A, profemora; B, mesofemora; C, metafemora, also a coxa separated from inferior epipleural margin by the metepimeron.

Type a male, No. 4095, a unique in the author's collection, Museum of the California Academy of Sciences. Found in Death Valley, Inyo County, California, October, 1922. Kindly given to the author by Mr. Roy L. Wagner, of Fresno, California. Unfortunately all of the tarsi are imperfect except two.

THREE NEW SPECIES OF CYBÆUS

BY HARRIET EXLINE

The following three species of *Cybæus* are closely related and will run to f' in the key provided by Chamberlin and Ivie¹ (p. 9). The chelicerae are strongly geniculate, there are 3 pairs of spines on the ventral side of tibia I and II, the opening of the epigynum is small, near the epigastric furrow, without a septum, the cephalothorax is over 3.5 mm, and the legs are annulate. These species must therefore be separated from *C. reticulatus* Simon and *C. shoshoneus* Chamberlin and Ivie, their nearest relatives. This section of the key to species of *Cybæus* may be expanded as follows:

f'. Legs annulate.

g. Opening of epigynum sharply defined laterally.

h. No sacs visible, or if sacs show through chitin, tubes also visible.

i. Opening of epigynum extending anteriorly to center of plate. No definite tubes of sacs visible
.....*C. olympiæ* sp. n.

i'. Opening of epigynum not extending anteriorly to center of plate. Tubes of epigynum appearing through chitin as two pairs of transverse thickenings.....*C. reticulatus* S.

h. Sacs alone visible through chitin. Two pairs of sacs arranged longitudinally.....*C. hatchi* sp. n.

g'. Opening of epigynum not sharply defined laterally.

h. Sacs of epigynum immediately anterior to opening of epigynum..... *C. shoshoneus* Ch. and I.

h'. Sacs of epigynum distant from opening of epigynum
.....*C. chaudiæ* sp. n.

Cybæus olympiæ Exline, n. sp.

Female: General features typical of the genus. Posterior eyes equidistant; clypeus two times diameter of the anterior

¹ Chamberlin and Ivie: North American Spiders of the Genera *Cybæus* and *Cybæina*. Bull. Univ. of Utah, vol. 23, no. 2, 1932.

lateral eyes; chelicerae moderately geniculate. Three pairs of spines on venter of tibiae I and II. Four small teeth and several denticles on the lower furrow of the chelicerae. Colulus not distinguishable.

Chelicerae, head and legs pale grayish yellow; thorax grayish with indications of radiating marks from the thoracic groove; legs banded with gray. Dorsum of abdomen dark gray with distinct yellowish lanceolate marks anteriorly and two large pairs of spots of same color on each side, posterior part with several pairs of yellowish chevrons. Sides and venter very pale grayish yellow.

Epigynum with medium-sized, heart-shaped opening which contacts epigastric furrow. No structures visible through chitin immediately surrounding opening but thickenings border the plate anteriorly and laterally. (fig. 1).

Measurements—Length: 8.7 mm.; cephalothorax: length 4.2, width 2.9, head 1.8 mm.; abdomen: length 4.4, width 3.0 mm.

Legs	I	II	III	IV
Coxa-Troch.	1.5	1.5	1.3	1.6
Femur	2.9	2.9	2.7	1.6
Pat.-Tibia		3.2	2.6	3.7
Metatarsus		2.0	1.9	
Tarsus		1.4	1.2	

Type, female, Olympia, Washington, May, 1932 (Harriet Exline), in collection of H. Exline.

Cybæus hatchi Exline, n. sp.

Female: Form typical but for the very broad abdomen. Clypeus nearly twice as broad as the diameter of the anterior lateral eyes; four stout teeth on the lower margin of furrows of chelicerae and 3-4 denticles; labium longer than wide, sternum broad, extending only halfway behind coxae; three pairs of spines on ventral face of tibiae I and II. Colulus distinct but very small.

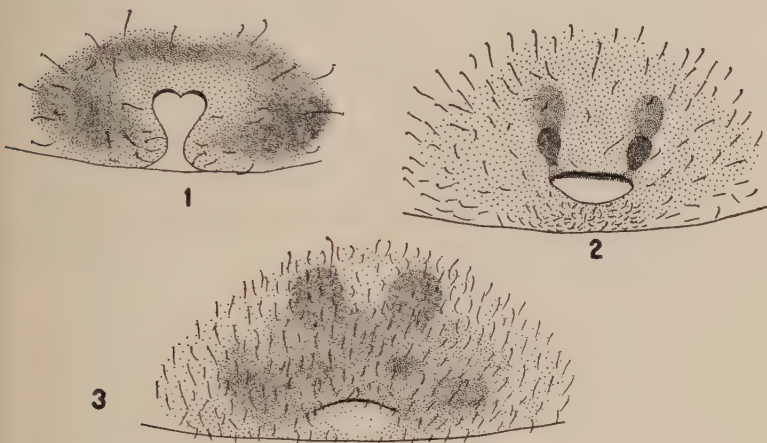
Color typical of dark species; chelicerae and anterior part of cephalothorax dark chestnut brown; thorax brownish yellow with dark bands radiating from the thoracic groove. Coxae of legs yellow, other segments with gray annulations, sometimes incomplete. Abdomen dark gray with usual lighter markings; a distinct median row of paired gray marks, sides very much flecked with light gray.

Epigynum with small opening near epigastric furrow; a pair of dark sacs clearly visible anterior to opening, and another pair not so near surface anterior to first pair. (f. 2).

Measurements—Length: 10.5 mm.; cephalothorax: length 4.5, width 2.5, head 2.0 mm.; abdomen: length 5.8, width 4.5 mm.

Legs	I	II	III	IV
Coxa-Troch.	1.7	1.4	1.5	1.5
Femur	2.6	2.5	2.2	2.1
Tibia-Pat.	3.2	3.2	2.7	3.4
Metatarsus	2.1	1.7	1.9	2.2
Tarsus	1.3	1.4	1.4	1.7

Type, female, Pierce, Idaho, August 30, 1933 (M. H. Hatch), in collection of H. Exline.



Explanation of Figures

Fig. 1. *Cybæus olympiæ* sp. n., epigynum of female.

Fig. 2. *Cybæus hatchi* sp. n., epigynum of female.

Fig. 3. *Cybæus chaudi* sp. n., epigynum of female.

Cybæus chaudi Exline, n. sp.

Female: Essentially typical in form, although cephalothorax is slightly more slender than usual. Posterior eyes equidistant, clypeus one and one-half times the diameter of the anterior lateral eyes. Tibiæ I and II with three pairs of spines. Sternum extending slightly more than half-way behind hind coxæ. Colulus minute but distinct.

Chelicerae and head chestnut brown; thorax and legs more yellowish, with smoky gray radiating marks on thorax and smoky gray annulations on legs. Abdomen gray with lighter gray markings in a paired row down center of dorsum and irregularly scattered over sides; venter fawn-colored.

Epigynum with small opening near epigstric plate, not clearly defined laterally. Thickenings visible under chitin immediately

anterior to opening in transverse row, but no definite structures are visible except a large pair of sacs in anterior region of plate. (fig. 3.)

Measurements—Length: 11.5 mm.; cephalothorax: length 5.5, width 2.9, head 2.1 mm.; abdomen: length 6.5, width 4.4 mm.

Legs	I	II	III	IV
Coxa-Troch.	1.8	1.6	1.5	1.6
Femur	2.9	2.9	2.6	3.1
Tibia-Pat.	3.3	3.4	2.9	3.7
Metatarsus	2.4	2.1	2.3	2.9
Tarsus	1.6	1.3	1.1	1.7

Type, female, Palouse, Washington, August 28, 1932 (M. H. Hatch), in collection of H. Exline.

The author wishes to acknowledge her indebtedness to Professor Trevor Kincaid under whose direction this work has been done, and to Dr. M. H. Hatch for collecting specimens and offering many helpful suggestions.

A NEW GENUS AND TWO NEW SPECIES OF COLEOPTERA FROM CALIFORNIA

(Scarabaeidae)

BY LAWRENCE W. SAYLOR

University of California, Berkeley, California

Leptohoplia Saylor, new genus

Entirely testaceous, eyes black. Elongate-oval, glabrous above, without scales, highly polished. Head unarmed, clypeus much thickened apically, sides parallel; eyes large (seemingly small from above). Antennæ 9-segmented, club one-fifth longer than the entire stem. Mentum obscured by its covering, a large conical brush composed of many long erect hairs. Thorax with complete margin, hind angles very broadly rounded, sides ciliate, arcuate, entire, surface moderately alutaceous. Elytra with prominent humeral umbones, striæ not evident. Abdomen with six visible segments. Front tibiæ bidentate externally; tarsi with first segment equal in length to two and three combined. Front claws with the inner one large, curved and cleft, the upper portion acute, the lower portion three times wider than the upper and truncate at apex; outer claws of front tarsi small acute slightly-curved, one-third as long as the inner claws. Tibiæ of middle leg slender; tarsi with one large claw divided into a small upper acute part and a lower part three times as wide and obliquely rounded at

apex, and a very small claw represented by an irregularly-shaped remnant one-sixth as long as the other. Tibiæ of hind legs slender at base and a little more than two times as long as wide at apex, with two large apical spurs; tarsi with one large entire claw and an extremely small rudiment of the other.

Genotype: Leptohoplia testaceipennis Saylor, new species.

A genus very difficult to place in the present classification. Probably nearest to *Hoplia*, but abundantly distinct as may be seen by the following summation of the main differences. I believe it represents a new tribe somewhat allied to *Hopliini*.

Hoplia

1. No hind tibial spurs.
2. Antennal club ovate, very small.
3. Surface usually densely scaly.
4. Body broad, depressed.
5. Middle and front tarsi with two well-developed claws, though one is longer.
6. Pygidium exposed from above.

Leptohoplia

1. Spurs well developed.
2. Antennal club very large.
3. Surface glabrous, no scales.
4. Body elongate-oval, convex.
5. These tarsi with one large claw and one small rudiment.
6. Pygidium hidden from above.

Leptohoplia testaceipennis Saylor, new species

Testaceous, glabrous, shining. Head convex, with a few scattered punctures near sides of front, vertex impunctate; eyes without a margin of hairs above; clypeal suture straight, not impressed; clypeus with sides parallel, apex greatly thickened, evenly rounded and reflexed slightly, disc sparsely punctured in basal half, a rather large polished piece separating the sides of the clypeal base from the corresponding parts of the front, half of this piece extending as a narrowed arm over part of the eye. Antennæ nine-segmented, club one-fifth longer than the entire stem. Thorax arcuately rounded at sides, hind angles very broadly rounded, entirely margined; disc finely irregularly very sparsely punctured. Elytra three times longer than the thorax, faintly rugose, very finely, not densely, punctured. Pygidium almost twice as wide as long, convex, finely moderately densely setigerously punctured. Abdomen polished, finely setigerously punctured, fifth segment longer than the sixth. Hind tibial spurs very long, slender and bluntly pointed, one three-fourths as long as the other. Length 5.5 mm.

Holotype and paratype in the collection of the California Academy of Sciences, and one paratype in the author's collection. All three specimens are from the collection of Dr. E. C.

Van Dyke and were taken in Imperial County (probably Imperial Valley) by J. C. Bridwell in June and July of 1912.

This very distinct species can be confused with no others of our fauna, nor is it closely related to any of them.

Aphodius essigi Saylor, new species

Oblong-oval, strongly shining, glabrous, rufo-piceous to somewhat brownish. Head moderately densely somewhat coarsely punctured; Clypeal suture obsolete at middle; apex of clypeus slightly emarginate, angles broadly rounded, genæ obtuse and moderately prominent beyond the eye. Sides of thorax somewhat arcuate, entire, front angles blunt and very obtuse, hind angles subangulate but obtuse, only slightly indicated, basal margin faintly sinuate each side of middle, base with strong entire margin; disc very densely punctured, with coarse and moderately coarse punctures intermixed and in about the same proportion. Elytral humeri rounded, striæ moderately coarsely not densely punctured, intervals subconvex, moderately densely finely punctured. Hind femora polished, very sparsely finely punctured, with a few scattered hairs. Mesosternum not carinate. Posterior tibiæ with unequal bristles at apex. Metasternum highly polished at middle, very finely sparsely punctured. Front tibiæ slightly crenate above the basal external tooth. Inner spur of front tibiæ acute, slightly curved. First segment of hind tarsi subequal to the next three combined. Length 4.3 mm.

The unique type is from Sonoma County, California, taken in December. This species runs to *A. consentaneus* in Horn's key, but is easily separated from it by the color, type of thoracic puncturation, distribution, etc.

PERSONALS

Our California entomologists have continued their accustomed activities the past season. Dr. E. C. Van Dyke made a profitable collecting trip to New Mexico by way of the Grand Canyon, returning through southern Colorado and Nevada, bringing home a large and valuable series of insects to be added to the collections of the Academy of Sciences. Dr. F. E. Blaisdell worked about Fallen Leaf Lake with excellent results and your editor had a most enjoyable trip with Dr. and Mrs. Cockerell to Grants Pass by way of the Pacific Highway, returning by the Redwood Highway, with the collection of our native bee fauna as an objective. —E. P. Van Duzee.

NOTES ON WESTERN APHIDS¹BY GEORGE F. KNOWLTON *GKE*

This paper includes descriptions of five apparently undescribed aphids. The writer is indebted to Professor M. A. Palmer of the Colorado Agricultural Experiment Station for her opinions on the *Cinara* species.

Macrosiphum sporadicum Knowlton, n. sp.

This large green aphid was sometimes taken in moderate abundance upon rabbit brush, *Chrysothamnus nauseosus*, in parts of Boxelder County, Utah, principally between Brigham City and Harper, and below Mantua, in Brigham Canyon. Living individuals are rather characteristic, with their large, plump abdomens and the hoary, grayish pruinose covering over the apple-green body. Mounted specimens, especially smaller individuals, closely resemble *Macrosiphum packi* Knowlton.

Apterous vivipara. Size large, 3.7 to 4.1 mm. long and 1.45 to 1.63 mm. across the abdomen; some smaller, only 2.4 mm. long; color apple green and heavily pruinose above. Head with vertex deeply emarginate; eyes prominent, ocular tubercles rudimentary or lacking; hairs on vertex about 0.07 mm. long and slightly capitate; antennæ blackish beyond proximal one-third of III; antennal I large, somewhat gibbus; III, 0.93 to 1.01 mm. long with 4 to 7 circular sensoria; IV, 0.92 to 1.1 mm. without sensoria; V, 0.76 to 0.79 mm.; VI, 0.14 + 0.94 to 0.15 + 1.2 mm.; rostrum not exceeding second coxæ; hind tibia 2.0 to 2.34 mm. long; tarsus black, 0.2 mm. long. Abdomen plump; cornicles blackish, 0.92 to 1.0 mm. long in summer forms and 0.75 mm. in stem mothers; cauda long and broad, with six to seven curved hairs on each side and one to three on dorsal surface near distal end.

Alate vivipara. Size 2.0 to 2.03 mm. long. Head with prominent antennal tubercles; eyes as in aptera; antennæ beyond basal fifth of III blackish; antennal III 0.81 to 0.88 mm. long and with 9 to 17 broad margined sensoria; IV, 0.82 to 1.0 mm.; V, 0.74 to 0.8 mm.; VI, 0.13 + 0.5 mm. long. Wings with media twice branched (once branched in one wing); veins blackish with very faint marginal shading. Abdomen with cornicles blackish, slim, 0.63 to 0.71 mm. long, with a slight enlargement for about 0.1 mm. preceding the flange.

Apterous ovipara. Color reddish tan and whitish pruinose; size 2.23 to 2.45 mm. long, and 1.1 to 1.23 mm. wide. Ocular

¹ Contribution from the Department of Entomology, Utah Agricultural Experiment Station.

Authorized for publication by Director.

tubercles lacking; antennal tubercles somewhat diverging; antennal III, 0.81 to 0.89 mm. long with 4 to 5 small sensoria; IV, 0.9 to 0.92 mm.; V. 0.71 mm.; VI. 0.14 + 0.95 mm. long. Hind tibiae 1.65 to 1.84 mm. long, with much of basal half swollen and covered with sensoria. Hairs on abdomen capitate, but seldom distinctly broad, flattened or flabellate, as in apterous viviparous females; cornicles 0.71 mm. long, distal half dusky.

Stem mothers were collected in Utah upon *Chrysothamnus nauseosus* in Brigham Canyon, May 29, 1928. Winged females were taken in Brigham Canyon on July 21, 1928, and one was collected on the same date near Logan. Wingless females were collected throughout the season, in Brigham Canyon from May to mid-October. Several collections were made at Honeyville and Harper, particularly during September and October 1927. A few specimens were taken near Deweyville, September 3, 1927. Specimens were taken at Brigham, October 11, 1927, and in Logan Canyon, September 15, 1928. One collection was made at Preston, Idaho, September 10, 1927. Type locality, near river crossing in Brigham Canyon, below Mantua, in Boxelder County, Utah (Knowlton).

Macrosiphum sporadicum is armed with flattened to somewhat flabelliform hairs suggesting a relationship to the genus *Capitophorus*. This species is closely related to *Macrosiphum packi* Knowlton (Pan-Pac. Ent., 4: 169-171; 5: 81-84), from which it differs in having a heavy grayish pulverulence covering the body above, more lateral hairs on the less tapered cauda, and in its larger size.

MACROSIPHUM PACKI Knowlton

This species usually has four or three lateral hairs on each side of the cauda; somewhat more slender than *sporadicum*. Large *packi* females taken at Nephi, September 19, 1928, measured 3.2 and 3.45 mm. long and 1.0 and 1.4 mm. wide across the abdomen, respectively.

Collections: in Utah upon *Chrysothamnus nauseosus* at Cedar Fort, August 22, 1932; at Draper, July 7, 1929; Junction Valley, August 13, 1932; Yost, August 13, 1932; and upon *C. parryi* at Nephi, September 27, 1927, and Vernon, May 24, 1929. Collected upon *C. nauseosus* at Paris, Idaho, August 16, 1927 (Knowlton).

CAPITOPHORUS ELONGATUS Knowlton

Collected in Utah upon *Chrysothamnus parryi* at Emery, July 28, 1928, at Salina, July 28, 1928, and at Vernon, May 24, 1929, and upon *C. nauseosus* at Cedar Fort, August 22, 1932 (Knowlton).

CAPITOPHORUS CESTLUNDI Knowlton

Collected in Utah upon *Chrysothamnus nauseosus* at Cedar Fort, August 22, 1932; Grouse Creek, August 13, 1932, and upon what appears to be *C. parryi* at Stockton and Clover, August 14, 1929. Specimens also were taken upon *C. nauseosus* at Fort Bridger and Lyman, Wyoming, August 4, 1932 (Knowlton).

CAPITOPHORUS UTENSUS Pack and Knowlton

Collected upon *Chrysothamnus viscidiflorus* at Bryce Canyon and near Panguitch on July 29, 1928; Curlew Valley, and Cedar Spring (Knowlton).

Aphis nigragregalis Knowlton, n. sp.

Bluish black to greenish black, covered with a slight pulverulence. Feeds upon young twig bark, tender stems, leaves, and bases of flowers, causing distortion of the younger apical portions of the plant. Host, *Chrysothamnus nauseosus*; a few collections on other species of *Chrysothamnus*. Commonly attended by ants and attacked by syrphid fly maggots, aphid lions, and both adult and larval ladybird beetles. This aphid is sluggish and not easily disturbed.

This species keys to *Aphis gregalis* in Gillette and Palmer's key (Ann. Ent. Soc. Amer., 25: 374-375).

Apterous vivipara. Size 1.4 to 1.5 mm. long and 1.0 to 1.1 mm. wide across plump abdomens; abdomen and sometimes thorax and head mottled or banded with black. Head vertex broadly rounded; rostrum reaching beyond second coxæ, with tip narrowly obtuse; antennæ blackish; antennal III, 0.23 to 0.29 mm. long with 2 to 7 rounded sensoria; IV, 0.12 to 0.15 mm., usually with 1 distal sensorium; V, 0.12 to 0.15 mm.; VI, 0.1 + 0.11 to 0.13 + 0.16 mm. Prothorax with well-developed tubercles; lateral glandular protruberence on mesothorax; hind tibia 0.65 to 0.75 mm. long. Abdomen plump with two pairs of well developed lateral tubercles; cornicles black, lightly imbricated, slightly tapered, 0.11 to 0.14 mm. long; cauda black.

Alate vivipara. Abdomen greenish black to bluish black with

slight pulverulence. Size 1.07 to 1.6 mm. long. Head with vertex rounded in front; rostrum reaching to or beyond second coxæ; antennæ with few pointed hairs which are scarcely as long as thickness of segments; antennal III, 0.21 to 0.3 mm. long with 6 to 10 circular sensoria; IV, 0.11 to 0.16 mm., with 0 to 2 sensoria; V, 0.11 to 0.15 mm.; VI, 0.1 + 0.14 to 0.11 + 0.17 mm. long. Prothoracic tubercles large; a lateral structure on mesothorax appears to be glandular; wing venation frequently normal but with great variation, especially in media of fore wing, one of the forks often being lost; hind tibiæ 0.61 to 0.74 mm. long. Abdomen moderately plump; cornicles short, cylindrical to slightly tapered, weakly imbricated, without a flange, 0.08 to 0.1 mm. long; cauda conical, usually with 4 or 5 hairs on each side.

Apterous ovipara. Similar to apterous vivipara but abdomen more elongate at caudal end. Size 1.45 to 1.76 mm. long and 0.9 to 1.0 mm. wide. Antennal III, 0.2 to 0.21 mm. long, with 0 to 1 sensorium; IV, 0.1 to 0.11 mm.; V, 0.11 to 0.13 mm.; VI, 0.08 + 0.11 mm. long. Cornicles 0.1 mm. long, cylindrical; hind tibia 0.57 mm. long, somewhat swollen, and armed with scattered sensoria, especially near the middle.

Apterous male. Small, 1.04 mm. long and 0.58 mm. wide; head broad, vertex well rounded; antennæ blackish; antennal III, 0.19 mm. long and armed with 10 to 15 rounded sensoria; IV, 0.11 mm. with 6 to 8 sensoria; V, 0.11 mm. with 3 to 5 sensoria; VI, 0.1 + 0.14 mm. long. Prothoracic and first abdominal lateral tubercles large and conspicuous; a glandular protuberance on lateral margin of mesothorax resembles the lateral tubercles to some extent but is more broadly rounded and does not project out so far as do prothoracic tubercles. Hind tibia 0.48 mm. long; cornicles black, cylindrical to tapered, 0.05 to 0.06 mm. long; cauda black, broadly cone-shaped, with about 3 hairs on each side.

Collected upon rabbit brush in Utah at Amalga, Blacksmith Fork Canyon, Brigham City, Beaver Dam, Deweyville, Fielding, Hansel's Mountains, Harper, Honeyville, Salt Lake City, Logan, Logan Canyon, Smithfield, Trenton, and Wellsville (Knowlton). Type locality, 3 miles north of Brigham City, Utah.

Aphis cryptus Pack and Knowlton is a closely related form from root and crown of match brush; it may be separated from the above species by its flanged cornicles.

Aphis zonassa Knowlton, n. sp.

Described from ten apterous and two alate viviparous females collected upon rabbit brush, *Chrysothamnus parryi*, near Kanab, Utah, June 26, 1927. This aphid is close to *Aphis lugentis* Williams. The body size of *zanassa* is considerably smaller than

A. lugentis; because of this, its different host plant relationship and the uniformly smaller number of secondary sensoria on antennal III, *zonassa* is described as a new species.

Apterous vivipara. Color black; size 1.52 to 1.7 mm. long and 1.0 and 1.1 mm. wide across plump abdomen. Head with ocular tubercles present; rostrum sometimes reaching to abdomen, narrowly obtuse at tip; black antennæ with a few inconspicuous hairs; antennal III, 0.27 to 0.32 mm. long and with 0 to 1 distal rounded sensorium; IV, 0.17 to 0.2 mm. and armed with 4 to 7 sensoria; V, 0.14 to 0.18 mm. with 0 to occasionally 1 secondary sensorium; VI, 0.1 + 0.13 to 0.12 + 0.2 mm. long. Prothoracic tubercles moderately well developed; legs short, black and thick; hind tibia 0.95 mm. long. First lateral abdominal tubercle well developed, other less developed; reticulations cover part of the abdomen; darkened lateral areas present on sides back of thorax; cornicles black, cylindrical to somewhat tapered before moderate flange, 0.22 to 0.25 mm. long; cauda black.

Alate vivipara. Color black, size 1.2 to 1.3 mm. long; black antennæ inserted below margin of head; eyes with ocular tubercles well developed; rostrum as in aptera; antennal III, 0.31 mm. long with 15 to 21 rounded sensoria; IV, 0.17 mm. with 11 sensoria; V, 0.14 mm. without secondary sensoria; VI, 0.08 + 0.14 mm. long. Thorax with wing venation normal (or media sometimes but one-branched); hind tibiæ 0.76 mm. long. Abdomen with dusky imbricated patches along sides and dusky patch behind cornicles with imbrications somewhat setulose; cornicles black, 0.17 to 0.2 mm. long; cauda black.

APHIS CRYPTUS Pack and Knowlton

Winged individuals were collected in Utah upon *Gutierrezia* at Deweyville, September 13, 1927, and upon *Chrysothamnus nauseosus* in Logan Canyon, October 4, 1929 (Knowlton).

DUROCAPILLATA UTAHENSIS Knowlton

Distorting the apical growth of *Chrysothamnus viscidiflorus* near Park Valley and the Rosebud Ranch in Boxelder County, Utah, on July 23, 1932; Lasal and Moab, July 26, 1932 (Knowlton).

Cinara zoarchursara Knowlton, n. sp.

Collected by Dr. Vasco M. Tanner of the Brigham Young University, Provo, Utah, upon *Abies concolor*, in the Deep Creek Mountains of Utah during June, 1928. This sparsely-haired

form has shorter and heavier legs than most species in the genus *Cinara*.

Apterous vivipara. Size 3.52 mm. long and 2.93 mm. wide across the abdomen. Head dusky, with prominent median suture; vertex broadly rounded; ocular tubercles rudimentary or lacking; rostrum reaching cornicles; hairs on vertex 0.03 to 0.04 mm. long, sparse; antennæ 1.42 mm. long, being blackish beyond middle of III; antennal III, 0.57 mm. long, with one small distal sensorium; IV, 0.16 with 1 sensorium; V, 0.27, with 1 secondary sensorium; VI, 0.16 + 0.02 to 0.03 mm. long, the short unguis being nearly as heavy as the base; hairs on antennæ fine, relatively sparse, and 0.02 to 0.03 mm. long. Thorax with some irregular blackish dorsal markings; legs short, stout, and clothed with fine hairs; hind tibiæ 1.5 mm. long, and 0.08 mm. thick at middle, hairs 0.03 mm. long; first joint of tarsi 0.05 long on shortest side and 0.14 mm. long at greatest length; distal segment 0.28 mm. long. Abdomen broad, with blackish dorsal and lateral areas, larger areas adjoining the cornicles and anterior to the cauda; abdominal hairs sparse, about 0.03 to 0.05 mm. long; cornicles small, blackish, on slightly raised bases 0.16 to 0.24 mm. across, which merge with blackish adjoining areas; cauda and anal plate blackish.

Cinara zoarcursara resembles *C. taxifoliæ* (Swain), *pseudotsugæ* (Wilson) and *splendens* (G. and P.) in possessing rather small cornicles mounted upon relatively flattened bases. It differs markedly from these species in being armed with shorter hairs, and differs in antennal segment ratios.

Type in the collection of the writer; paratypes in the collection of the Brigham Young University insect collection.

Cinara chamberlini Knowlton, n. sp.

Material received from Professor W. J. Chamberlin of the Oregon Agricultural Experiment Station on February 18, 1931. One collection had been made upon white pine, *Pinus monticola*, at Union Creek Ranger Station, Jackson County, Oregon, August 6, 1930, the type locality. The other collection was made at Chico, Kitsop County, Washington, May 6, 1930. Reported as damaging sugar pine and white pine.

Apterous vivipara. Large, 5.6 to 6.3 mm. long and 3 to 3.2 mm. wide across the abdomen. Head with median suture; ocular tubercles present or absent; rostrum reaching to or beyond middle of abdomen; antennæ dusky beyond middle of III and armed with rather fine hairs; antennal III, 1.1 to 1.42 mm. long, with 6 to 7

sensoria; IV, 0.54 mm. with 2 to 4 sensoria; V, 0.61 mm. with 1 secondary sensorium; VI, $0.18 + 0.05$ to $0.21 + 0.06$ mm. long. Hind

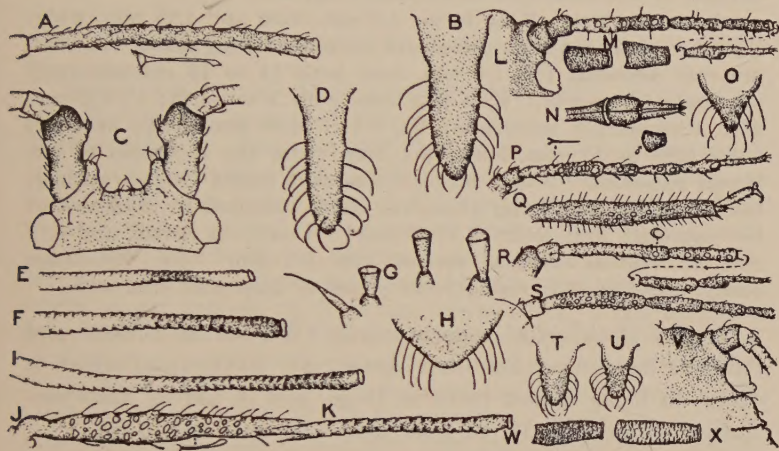


Fig. 1. *Macrosiphum sporadicum* n. sp. A, antennal III of alate; B, cauda of apterous; C, head of alate; D, cauda of alate; E, cornicle of alate; F, cornicle of stem mother; G, abdominal hairs of apterous; H, anal plate of apterous; I, cornicle of apterous; J, proximal portion of hind tibia of oviparous; K, cornicle of oviparous. *Aphis nigragregalis* n. sp. L, antenna of apterous; M, cornicles of apterous; N, apical portion of rostrum, apterous; O, cauda of apterous; P, antenna of alate; Q, hind tibia of oviparous. *Aphis zonassa* n. sp. R, antenna of alate; S, antenna of apterous; T, cauda of apterous; U, cauda of alate; V, head and prothorax of apterous; W, cornicle of alate; X, cornicle of apterous.

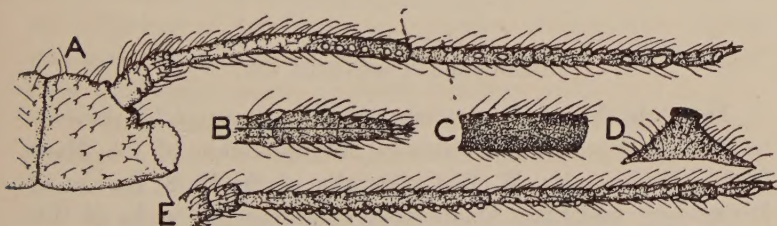


Fig. 2. *Cinara chamberlini* n. sp. A, head and antenna of apterous; B, distal end of rostrum, apterous; C, section of hind tibia of apterous; D, cornicle of apterous; E, antenna of alate.

tibia curved, 6 to 6.1 mm. long; hairs rather numerous and not equal in length to thickness of middle of hind tibia. Cornicles blackish, 0.52 mm. in diameter at the base, with numerous hairs; hairs on dorsum of abdomen 0.07 to 0.1 mm. long, fine.

Alate vivipara. Body large, 4.6 mm. long and 1.75 mm. wide: Head broad, dusky, with prominent median suture; ocular tubercles present; antennal III, 1.1 mm. long with 14 to 16 conspicuously tuberculate sensoria; IV, is 0.48 mm. with 3 sensoria; V, 0.6 mm. with 1 secondary sensorium; VI, 0.2 + 0.06 mm. long; antennal hairs 0.09 to 0.1 mm. long, less than twice the thickness of antennal segments. Wings large, evanescent media twice-branched; hind tibia 5.4 mm. long, numerous hairs subequal to thickness of the segment; first joint of hind tarsi 0.1 mm. on dorsal and 0.17 mm. on ventral margin; second joint 0.3 mm. long. Cornicles dusky, conspicuously rising from a conical base 0.42 mm. wide.

Cinara chamberlini runs to *edulis* (Wilson) in Gillette and Palmer's key (Ann. Ent. Soc. Amer., 24: 844), from which it differs in being almost twice as large, and in having more secondary sensorio on III of both alate and apterous forms.

CINARA PONDEROSÆ (Williams)

Collected upon yellow pine, *Pinus ponderosa*, Corvallis, Oregon, October, 1931. Also collected upon white pine (Chamberlin).

ANOECIA QUERCI (Fitch)

Four winged females were taken upon one small twig of *Chrysothamnus nauseosus* in Brigham Canyon, Utah, October 5, 1929; probably accidental (Knowlton).

PSEUDOGAURAX SIGNATUS LW.

This little fly, which reminds one of a *Drosophila*, prevents to a small degree the unrestricted multiplication of the Black Widow Spider. Mr. W. B. Cartwright, of the U. S. Bureau of Entomology and Plant Quarantine, collecting egg sacks of this spider during July, 1934, that contained puparia of this fly. Apparently all the eggs in these sacks had been destroyed. Dr. C. E. Greene of the U. S. Bureau, determined the species.—H. H. Keifer, California State Department Agriculture.

A NEW SPECIES OF PLATYPEDIA (CICADIDÆ)

BY F. H. WYMORE

*Berkeley, California**Platypedia sierra* Wymore, new species

Small, slender, dull black, marked with tawny olive¹, clothed with fine silvery appressed pubescence above, longer and more erect on sternum. Head broader than front margin of pronotum; front moderately produced, sulcus interrupted at the seventh or eighth transverse ridge; base of rostrum, basal segment and tip of antennæ, and edge of supra-antennal plates, tawny olive. Thorax with posterior margin of segments and median groove of pronotum tawny olive. Basal membrane of both pairs of wings nearly white; costal margin of forewings tawny olive to end of radial cell; other veins darker, the veins surrounding basal cell, apical areas of both pairs of wings and the second anal vein of the forewings black; dark color extending about half way to base on the third longitudinal vein of the hind wings. Femora and tibiæ of fore legs brown², the middle and hind legs tawny olive marked with black. Uncus black 2 mm. long, 0.5 mm. in width, emarginate at apex, sides almost parallel when viewed from above, seen in profile slightly arcuate; ædeagus tubulous, tapering distally into two apical and three subapical lobes, two of which are lateral and one median, the median lobe about one-third the length of the lateral. Sternum black with long white hairs along lateral edges of segments; last ventral segment rounded at apex. Valve of male 4 mm. long. Length 19 mm., breadth 5.5 mm. across eyes. Expanse of fore wing 42 mm., width 7.5 mm.

Holotype, male (No. 4104, Calif. Acad. Sci., Ent.), allotype female (No. 4105, Calif. Acad. Sci., Ent.) and numerous designated paratypes from a series of specimens, thirty-eight in my own collection and twenty-six, taken by Dr. E. C. Van Dyke, in the collection of the California Academy of Sciences. All the specimens were taken in the vicinity of the Sequoia National Park, California, mostly in April and May, 1929.

In color and general shape of the body this species somewhat resembles *P. aperta* Van Duzee, although it is generally larger and the markings are paler, while the uncus seems rather distinctive. The ædiagus more closely resembles that of *P. vanduzeei* Davis. The individual specimens examined vary considerably in size, some of the smaller ones being only 16 mm.

¹ Tawny olive, Ridgway. Pl. XXIX, ser. i.

² Between Liver Brown and Carob Brown, Ridgway, Pl. XIV.

long and 4.5 mm. across eyes, with a wing expanse of about 37 mm. and 6 mm. in width of wing. The basal membrane of the wings of some is about the same color as the body markings.

NOTES ON TWO LOCAL BUTTERFLIES

BY M. DOUDOROFF

Stanford University, California

Euphydryas baroni H. Edw. There has been a good deal of confusion with regard to this species. J. D. Gunder (Pan-Pac. Ent. July, 1929) placed it as a "race" of *E. editha* Bdv. due to the resemblance of the male genitalia of the two. *E. baroni* flies from Sonoma Co. northward; *editha* from the same southward.

Near Calistoga, both insects are found in the same locality. Each retains its individuality, there being apparently no interbreeding, and *E. editha* flying nearly a month before *E. baroni*. Genitalic studies to the contrary, then, we must assume the two to be fully distinct and autonomous species, since, by definition, two sub-species can not co-exist in the same territory. Unfortunately, this opens to criticism any classification based on genitalic studies alone. "*Tr. F*" *sternitzkeyi* Gun. is an aberration of *E. editha* and not of *E. baroni*, as described.

Plebejus pheres Bdv. This species has been confused by many collectors with several subspecies (?) of *P. icaroides* Bdv. Hence, records of its occurrence in Idaho, Utah, Colorado, Vancouver Isd., etc. *P. pheres* is apparently limited to a small area, almost entirely within the city of San Francisco. Up until 1926, it was very common at 14th Ave. and Taraval St. in April. Then, coincident with construction in that area, it disappeared from the locality completely. In 1930 I rediscovered it on the sand dunes west of 20th Ave. It does not begin flying until about June 1. Unless a new locality is soon found, the species is probably doomed to complete extinction.